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10/798,132	03/11/2004	Tomoyuki Kubo	501558.20012	5848

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EXAMINER

GARCIA JR, RENE

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,132

Applicant(s)

KUBO, TOMOYUKI

Examiner

Rene Garcia, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 26 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10 and 16 is/are allowed.
- 6) ☒ Claim(s) 1-7, 12, 13 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 26 April 2006. These drawings are acceptable.

Claim Objections

2. Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It has already been established that either first or second surface of heatsink is in thermal communication with driver element, and void portion is an opening by definition of void itself which has the limitation of being on the one of first or second surfaces. Therefore claim 17 provides no new structural limitations not already presented in claim 1.
3. Claim 20 is objected as being indefinite in that it fails to point out what is included or excluded by the claim language. The term "substantially" is indefinite in that it fails to point out what is included or excluded by the claim language (can mean either 100 percent or 0 percent with regards to overlapping entirety of head unit).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, 4, 12, 13, 14, 15 and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Hilton et al. (US 6,655,785).

Hilton et al. discloses the following claimed limitations:

*regarding claims 1 and 14, recording apparatus/**printhead assembly, 10/** (fig. 1; col. 2, lines 39-51) comprising:

*head unit/**print head, 14/** (fig. 1; col. 2, lines 52-54) including an actuator/**piezoelectric, 40/** (fig. 3; col. 3, lines 8-16) which generates energy required for recording predetermined patterns of image on a recording medium

*circuit board/**printed wiring member, 38/** (fig. 3, col. 3, lines 8-11) including a driver element/**electrically conductive traces/** (fig. 3, col. 3, lines 18-19) which drives said actuator of said head unit/**14/**

*heatsink/**36/** (fig. 3) having a first surface/**36a/** and a second surface/**36b/** opposite to said first surface/**36a/**, and having at least one of said first and second surfaces disposed in thermally conductive communication with said driver element (fig. 3, col. 3, lines 20-22)

*wherein said heatsink/**36/** has a void portion (holes fig. 3) on at least one of said first/**36a/** and second surfaces/**36b/**, said void portion being opposed to said head unit/**14/** (fig. 2 & 3, col. 2, lines 52-54 – printhead comprises housing 18 and print element 20, holes of heatsink are opposed housing portion)

*regarding claims 3 and 15, wherein said void portion of said heatsink/**36/** includes an aperture/**holes/** formed through said heatsink/**36/** between said first surface/**36a/** and said second surface/**36b/** such that said aperture/**holes/** overlaps at least a portion of said head unit/**14/**

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(housing/18/ of printhead) as viewed in a direction in which said void portion of said heatsink/36/ and said head unit/36/ are opposed to each other (fig. 2 & 3)

*regarding claim 4, wherein said void portion/**holes**/ of said heatsink/36/ includes a plurality of holes formed through said heatsink/36/ between said first surface/36a/ and said second surface/36b/ (fig. 2 & 3)

*regarding claim 13, aperture/**hole**/ is open at one edge of said heatsink/36/ (fig. 3)

*further regarding claim 14, plurality of head units/**print heads, 14 & 16**/ (fig. 1 & 9; col. 2, lines 39-51; col. 6, line 66 – col. 7, line 44)

*regarding claim 17, one of said first/36a/ and second/36b/ surfaces of said heatsink/36/ is disposed in thermally conductive communication with said drive element/**traces of wiring member38**/ (fig. 3)

*void portion/**holes**/ has an opening that opens in said one of said first/36a/ and second/36b/ surfaces (fig. 3)

*regarding claim 18, heatsink/36/ includes a plate portion (fig. 3, col. 3, lines 16-17)

*heatsink/36/ has an aperture/**hole**/ which is opposed to said head unit and which is formed through a thickness of said plate portion (fig. 2 & 3, col. 2, lines 52-54 – printhead comprises housing 18 and print element 20, holes of heatsink are opposed housing portion)

*regarding claim 19, circuit board/**wiring board, 38/** is disposed between said heatsink/**36/** and said head unit/**14/** (wiring board is between heatsink and housing/**38/** of head unit), and is held in contact at opposite surfaces thereof with said head unit and said plate portion of said heat sink/**36/** (fig. 2, 3, 5)

*regarding claim 20, void portion/**holes/** of said heatsink/**36/** includes an aperture/**holes/** formed through said heatsink/**36/** between said first surface/**36a/** and said second/**36b/** surface such that said aperture/**holes/** overlaps substantially (examiner takes the position that “substantially” is what is necessary to cover housing/**118/** to mount print element/**120/** to housing/**118/** as shown in fig. 5) an entirety of said head unit (fig. 2 & 3, col. 2, lines 52-54 – printhead comprises housing 18 and print element 20, holes of heatsink are opposed housing portion) as viewed in a direction in which said aperture/**holes/** of said heatsink/**36/** and said head unit are opposed to each other (fig. 2 & 3)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hilton et al. (US 6,655,785) in view of Isono et al. (US 6,604,817).

Hilton et al. disclose the following claimed limitations:

*regarding claim 2, head unit/**print head, 14/** further includes a cavity unit/**manifold assembly, 42/** (figs. 3 & 4) which stores an ink in cavities formed therein (col. 3, lines 53-65)

Hilton et al. does not disclose the following claimed limitations:

*regarding claim 2, actuator is a piezoelectric actuator which is superposed on said cavity unit and which is operable to eject the ink onto the recording medium

*regarding claim 7, cavity unit of said head unit has a surface which is to be opposed to the recording medium, and a plurality of nozzle holes which are held in communication with the respective cavities of said cavity unit and which are open in said surface

Isono et al. discloses the following:

*regarding claim 2, actuator is a piezoelectric actuator/**20/** which is superposed on said cavity unit/**cavity plate, 10/** and which is operable to eject the ink onto the recording medium (fig. 1; col. 6, lines 52-58) for the purpose of making the print head smaller and cheaper without increasing the number of places where ink may leak

*regarding claim 7, cavity unit/**cavity plate, 10/** of said head unit/**print head/** has a surface/**nozzle plate, 11/** which is to be opposed to the recording medium, and a plurality of nozzle holes/**nozzles, 15/** which are held in communication with the respective cavities of said cavity unit/**cavity plate, 10/** and which are open in said surface/**nozzle plate, 11/** (figs. 5 and 6; col. 6, lines 59-67) for the purpose of ejection of ink

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize an actuator is a piezoelectric actuator which is superposed on said cavity unit and which is operable to eject the ink onto the recording medium; and cavity unit

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of said head unit has a surface which is to be opposed to the recording medium, and a plurality of nozzle holes which are held in communication with the respective cavities of said cavity unit and which are open in said surface as taught by Isono et al. into Hilton et al. for the purpose of making the print head smaller and cheaper without increasing the number of places where ink may leak; and ejection of ink

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hilton et al. (US 6,655,785) in view of Teung (US 6,945,638).

Hilton et al. disclose all the claimed limitations except for the following:

*regarding claim 5, heat dissipation member disposed in thermally conductive communication with said head unit and spaced apart from said heatsink, so as to dissipate heat from said head unit

Teung et al. discloses the following:

*regarding claim 5, heat dissipation member/**second ultimate heatsink, 590/** disposed in thermally conductive communication with said head unit/**dispensing structure, 550/** and spaced apart from said heatsink/**heatsink conduit, 580/** so as to dissipate heat from said head unit/**550/** (figs. 5 and 6; col. 6, lines 22- 58; col. 7, lines 23-34) for the purpose of reducing heat from the dispensing structure

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a heat dissipation member disposed in thermally conductive communication with said head unit and spaced apart from said heatsink, so as to dissipate heat from said head unit as taught by Teung et al. into Hilton et al. for the purpose of reducing heat from the dispensing structure

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9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hilton et al. (US 6,655,785) as modified by Teung (US 6,945,638), as applied to claim 5 above and further in view of Sugiyama (US 6,339,444).

Hilton et al. as modified by Teung disclose all the claimed limitations except for the following:

*regarding claim 6, circuit board further includes a wiring board portion which has an end portion superposed on said one head unit

*wherein heat dissipation member is superposed on said end portion of said wiring board portion of said circuit board, such that said heat dissipation member is opposed to said head unit, with said end portion of said wiring board portion being interposed between said heat dissipation member and said head unit

Sugiyama disclose the following:

*regarding claim 6, circuit board further includes a wiring board portion/**wiring substrate, 2595/** which has an end portion superposed on said one head unit/**thermal head substrate, 2552/** (figs. 24 and 25) for the purpose of securing thermal head substrate and wiring board to the heatsink and pull heat away from head unit

*wherein heat dissipation member/**heatsink, 2551/** is superposed on said end portion of said wiring board portion/**2595/** of said circuit board/**2552/**, such that said heat dissipation member/**2551/** is opposed to said head unit/**2552/**, with said end portion of said wiring board portion/**2595/** being interposed between said heat dissipation member/**2551/** and said head unit/**2552/** (fig. 24 and 25) for the purpose of securing thermal head substrate and wiring board to the heatsink and pull heat away from head unit

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a circuit board further includes a wiring board portion which has an end portion superposed on said one head unit, wherein heat dissipation member is superposed on said end portion of said wiring board portion of said circuit board, such that said heat dissipation member is opposed to said head unit, with said end portion of said wiring board portion being interposed between said heat dissipation member and said head unit as taught by Sugiyama into Hilton et al. as modified by Teung for the purpose of securing thermal head substrate and wiring board to the heatsink and pull heat away from head unit

Allowable Subject Matter

10. Claims 8, 9, 10, 16 are allowed.

11. The following is an examiner's statement of reasons for allowance: The primary reason for the allowance of claims 8 and 9 is the inclusion of the limitations being for a recording apparatus including a circuit board further includes a wiring board portion which extends along an outside surface of said bottom plate portion of said body frame from said head unit toward a periphery of said body frame; heatsink includes a horizontally extending plate portion which has said void portion and which is interposed between said bottom plate portion of said body frame and said wiring board portion of said circuit board. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 10 is the inclusion of the limitations being for a recording apparatus including a circuit board further includes a wiring board portion which extends along an outside surface of said bottom plate portion of said body frame from said one

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head unit toward a periphery of said body frame; driver element is disposed on said wiring board portion; heatsink includes a horizontally extending plate portion which has said void portion and which is disposed on one of opposite sides of said wiring board portion remote from said driver element. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 16 is the inclusion of the limitations being for a recording apparatus including a heatsink including a horizontally extending plate portion and a vertically extending plate portion, and disposed in thermally conductive communication with said driver element, said horizontally extending plate portion extending along said bottom plate portion of said body frame and having an aperture opposed to said head unit, and said vertically extending plate portion extending vertically from said horizontally extending plate portion. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

12. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The primary reason for indicating the allowable subject matter of claim 11 is the inclusion of the limitations being for a recording apparatus including a body frame further includes a back plate portion extending vertically from said bottom plate portion, wherein said heatsink includes a

horizontally extending plate portion which has said void portion and which extends along an outside surface of said bottom plate portion of said body frame; circuit board including said driver element extends along said horizontally extending plate portion of said heatsink; heatsink further includes a vertically extending plate portion which extends along an outside surface of said back plate portion of said body frame. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Response to Arguments

13. Applicant's arguments with respect to claims 1-7 and 12-16 have been considered but are moot in view of the new ground(s) of rejection.

14. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., through-hole for minimizing transfer of heat from the heatsink to the head unit [page 14]) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Merz (US 6,908,170) teaches a heat sink opposed a fluid ejector element but does not provide void features on any surface or within heat sink that are opposed to fluid ejector element. Hediger (US 4,821,051) and Beaman et al. (US 5,079,567) teach using a heat sink in thermal contact with IC [drive element] for a LED print head and fails to teach or suggest void features

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opposed to print head portion. Askren et al. (US 6,007,176) teaches a heat sink with horizontal and vertical features used in thermal contact with a [thermal print head] heater chip and includes a void feature opposed to heater chip. However the void feature is used as a passage for fluid to be ejected from cartridge, and fails to teach or suggest void opposed to a head unit and driver element. Masayuki (JP 09-076485) teaches a heat sink opposed to a drive IC and a [inkjet] unit but fails to teach the necessary void features. No combination with Askren et al. and Masayuki can be made due to lack of necessity of void feature for ink passage from a cavity to ejection orifice.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Communications with the USPTO

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rene Garcia, Jr. whose telephone number is (571) 272-5980. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Rene Garcia Jr
07/06


STEPHEN MEIER
SUPERVISORY PATENT EXAMINER